United States Patent [19]

Sato et al.

[11] Patent Number: 5,428,721

[45] Date of Patent: Jun. 27, 1995

[54] **DATA PROCESSING APPARATUS FOR EDITING IMAGE BY USING IMAGE CONVERSION**

[75] Inventors: **Fumitaka Sato; Ken Kishida**, both of Tokyo, Japan

[73] Assignee: **Kabushiki Kaisha Toshiba**, Kawasaki, Japan

[21] Appl. No.: **649,976**

[22] Filed: **Feb. 4, 1991**

[30] **Foreign Application Priority Data**

Feb. 7, 1990	[JP]	Japan	2-27937
Apr. 27, 1990	[JP]	Japan	2-113211
Apr. 27, 1990	[JP]	Japan	2-113236

[51] Int. Cl.^{6} **G06T 3/00**

[52] U.S. Cl. **395/133**; 395/136; 395/137; 395/138

[58] Field of Search 395/133–138, 395/119–121, 155–158, 161; 382/44–46

[56] **References Cited**

U.S. PATENT DOCUMENTS

H997	11/1991	Bronson	340/747
4,641,255	2/1987	Hohmann	395/135
4,752,828	6/1988	Chapuis et al.	395/136 X
4,837,844	6/1989	Urushibata	395/136 X
4,951,231	8/1990	Dickinson et al.	395/135
5,067,087	11/1991	Seki et al.	395/135 X

OTHER PUBLICATIONS

Tutorial for Adobe Illustrator 88 TM, Adobe Systems Inc., pp. 1, 93–115, 1988.

Myers et al., "Garnet, Comprehensive Support for Graphical, Highly Interactive User Interfaces," IEEE Computer, vol. 23, No. 11, pp. 71–85, Nov. 1990.

Primary Examiner—Almis R. Jankus
Attorney, Agent, or Firm—Finnegan, Henderson, Farabow, Garrett & Dunner

[57] **ABSTRACT**

Translation handles are set on vertices of a conversion source image frame by a mouse. Frame move processing, enlargement/reduction processing, rotation processing, and deforming processing are performed in accordance with the number and positions of the set translation handles. The image within the frame is operated in accordance with the shape of the conversion source image frame, and the operated image is displayed within the conversion destination image frame. In geometric conversion which requires enlargement/reduction and rotation and preserves parallelism of lines, image conversion is performed by one processing including addition instructions and not including multiplication and division calculations.

13 Claims, 19 Drawing Sheets